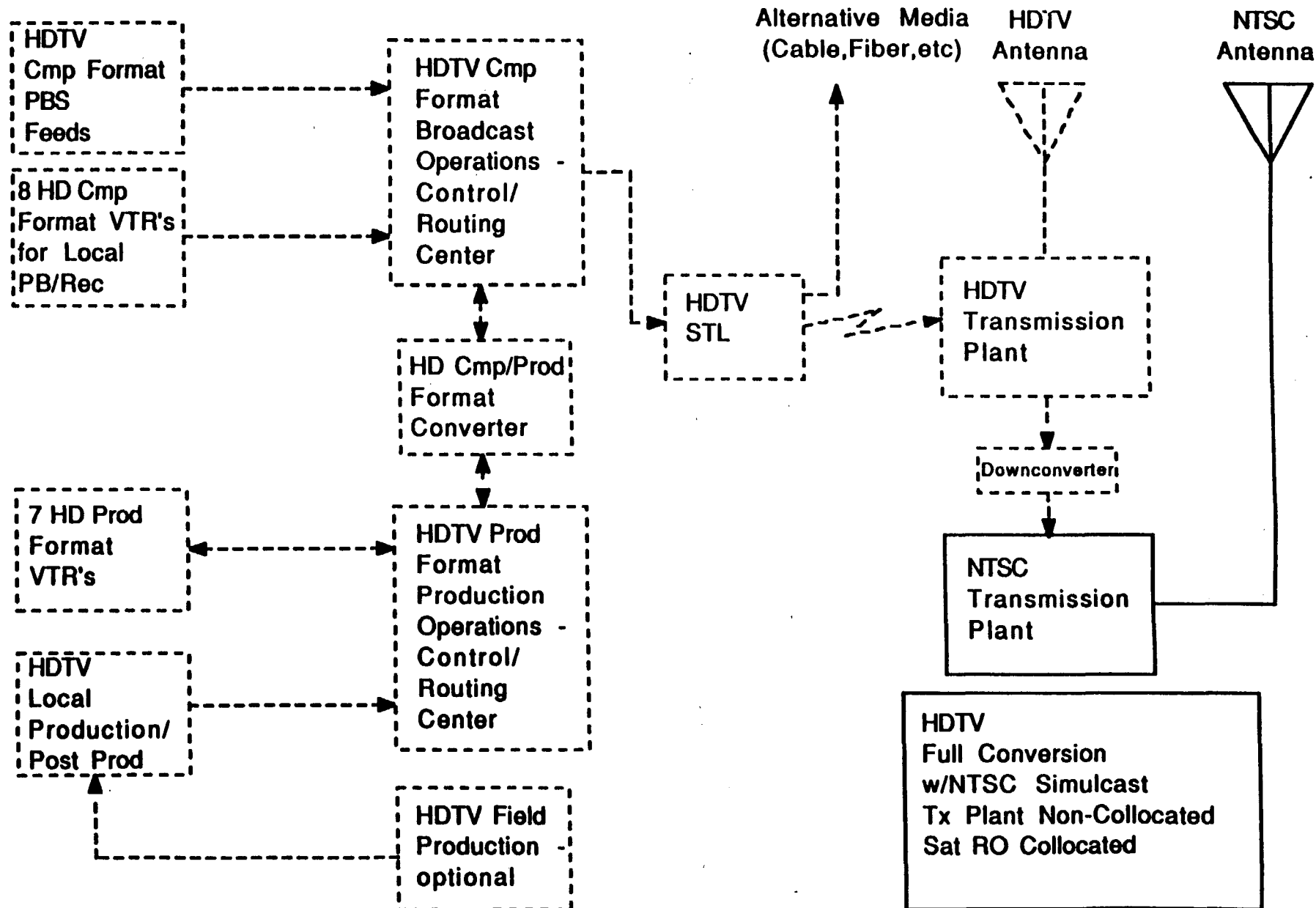


**MODEL #5 HDTV - FULL CONVERSION**

<b>4</b>	<b>HD wideband VTR's</b>	<b>\$320K/each</b>	<b>\$1,280K</b>
<b>8</b>	<b>HD B&amp;W monitors (8")</b>	<b>\$2K/each</b>	<b>\$16K</b>
			<hr/>
<b>Subtotal</b>			<b>\$1,296K</b>
<b>Installation Materials (5%)</b>			<b>\$65K</b>
			<hr/>
<b>Model 5 Total</b>			<b>\$1,361K</b>
 <b>Total for Models 1, 2, 3, 4, &amp; 5</b>			 <b>\$9,776K</b>



## **VII. Complete Station Packages**

**Pass-Through Network Programming**

VHF Station, Low Band (best case)	
Transmission Package 1	\$936K
Broadcast Origination (Model 1)	\$770K

Total	<hr/> \$1.706M
-------	----------------

VHF Station, Low Band (worst case)	
Transmission Package 2	\$3,484K
Broadcast Origination (Model 1)	\$770K

Total	<hr/> \$4.254M
-------	----------------

VHF Station, High Band (best case)	
Transmission Package 3	\$986K
Broadcast Origination (Model 1)	\$770K

Total	<hr/> \$1.756M
-------	----------------

VHF Station, High Band (worst case)	
Transmission Package 4	\$3,534K
Broadcast Origination (Model 1)	\$770K

Total	<hr/> \$4.304M
-------	----------------

UHF Station (best case)	
Transmission Package 5	\$1,116K
Broadcast Origination (Model 1)	\$770K

Total	<hr/> \$1.886M
-------	----------------

UHF Station (worst case)	
Transmission Package 6	\$3,664K
Broadcast Origination (Model 1)	\$770K

Total	<hr/> \$4.434M
-------	----------------

**Limited Playback**

VHF Station, Low Band (best case)	
Transmission Package 1	\$936K
Broadcast Origination (Model 2)	\$1,276K
Total	<hr/> \$2.212M

VHF Station, Low Band (worst case)	
Transmission Package 2	\$3,484K
Broadcast Origination (Model 2)	\$1,276K
Total	<hr/> \$4.760M

VHF Station, High Band (best case)	
Transmission Package 3	\$986K
Broadcast Origination (Model 2)	\$1,276K
Total	<hr/> \$2.262M

VHF Station, High Band (worst case)	
Transmission Package 4	\$3,534K
Broadcast Origination (Model 2)	\$1,276K
Total	<hr/> \$4.810M

UHF Station (best case)	
Transmission Package 5	\$1,116K
Broadcast Origination (Model 2)	\$1,276K
Total	<hr/> \$2.392M

UHF Station (worst case)	
Transmission Package 6	\$3,664K
Broadcast Origination (Model 2)	\$1,276K
Total	<hr/> \$4.940M

**Production**

VHF Station, Low Band (best case)	
Transmission Package 1	\$936K
Broadcast Origination (Model 4)	\$8,566K
Total	<hr/> \$9.502M

VHF Station, Low Band (worst case)	
Transmission Package 2	\$3,484K
Broadcast Origination (Model 4)	\$8,566K
Total	<hr/> \$12.050M

VHF Station, High Band (best case)	
Transmission Package 3	\$986K
Broadcast Origination (Model 4)	\$8,566K
Total	<hr/> \$9.552M

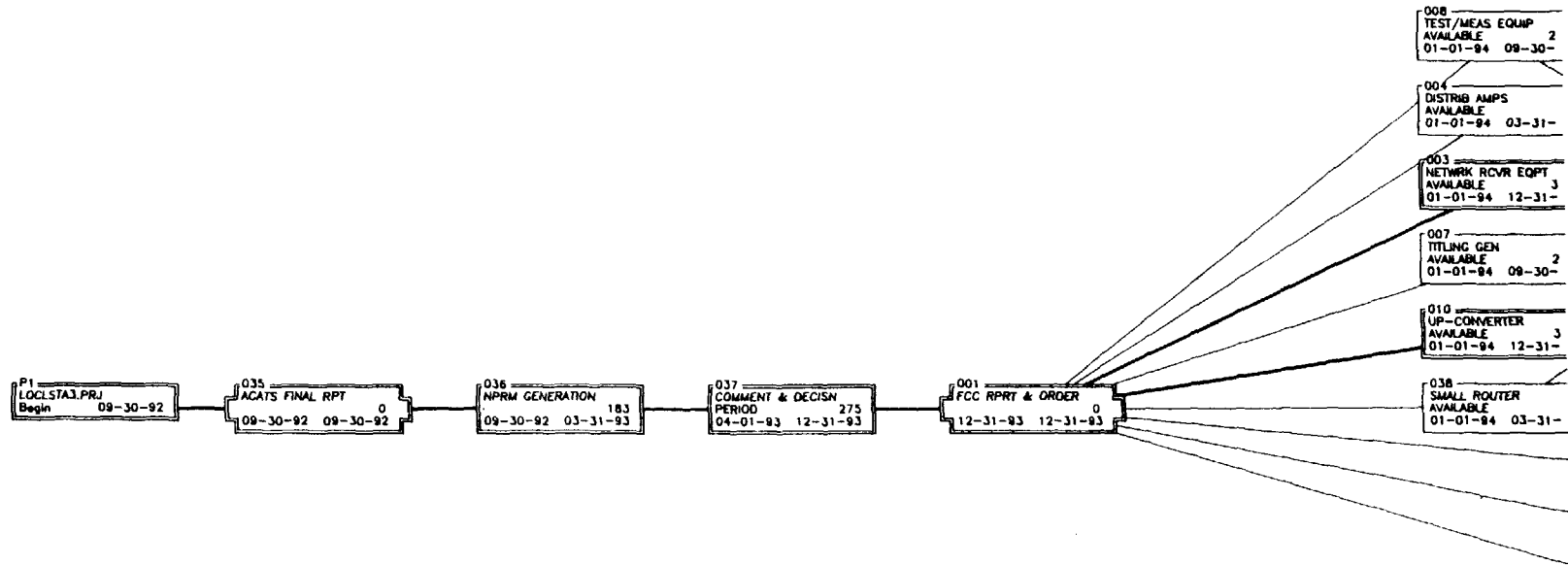
VHF Station, High Band (worst case)	
Transmission Package 4	\$3,534K
Broadcast Origination (Model 4)	\$8,566K
Total	<hr/> \$12.100M

UHF Station (best case)	
Transmission Package 5	\$1,116K
Broadcast Origination (Model 4)	\$8,566K
Total	<hr/> \$9.682M

UHF Station (worst case)	
Transmission Package 6	\$3,664K
Broadcast Origination (Model 4)	\$8,566K
Total	<hr/> \$12.230M

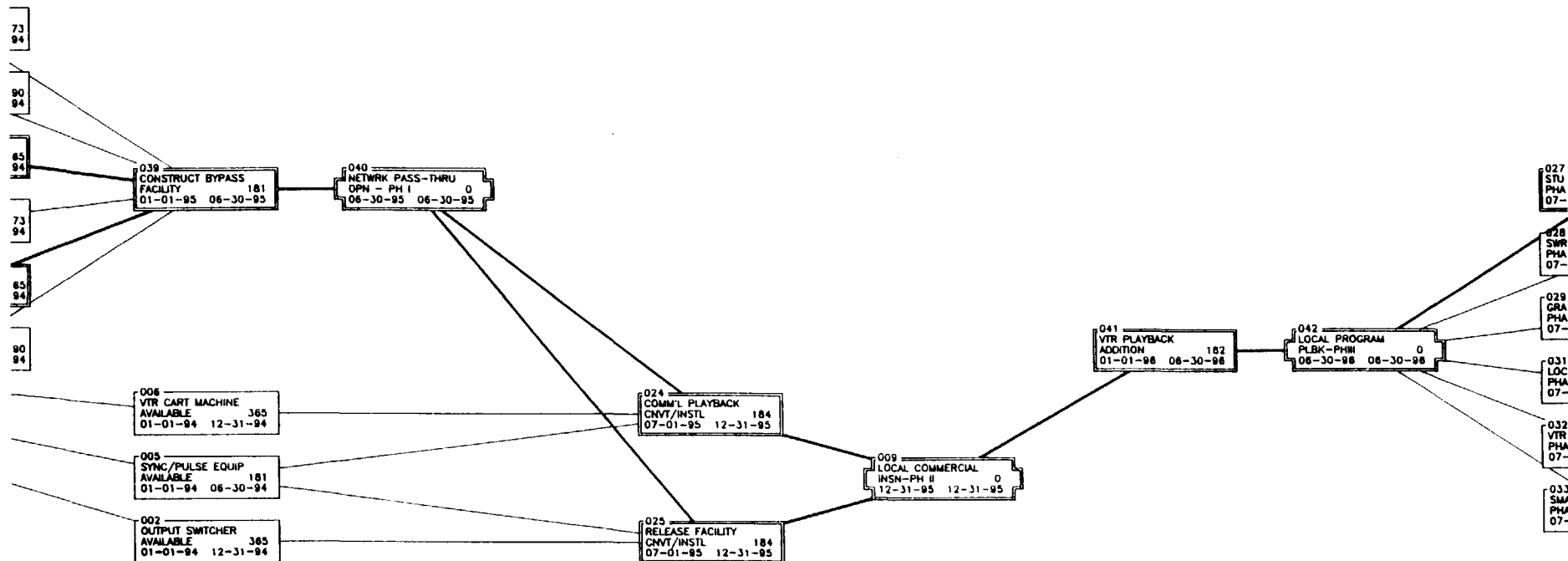
LOCAL STATION: FU

REPLACEMENT - SCENARIO 3

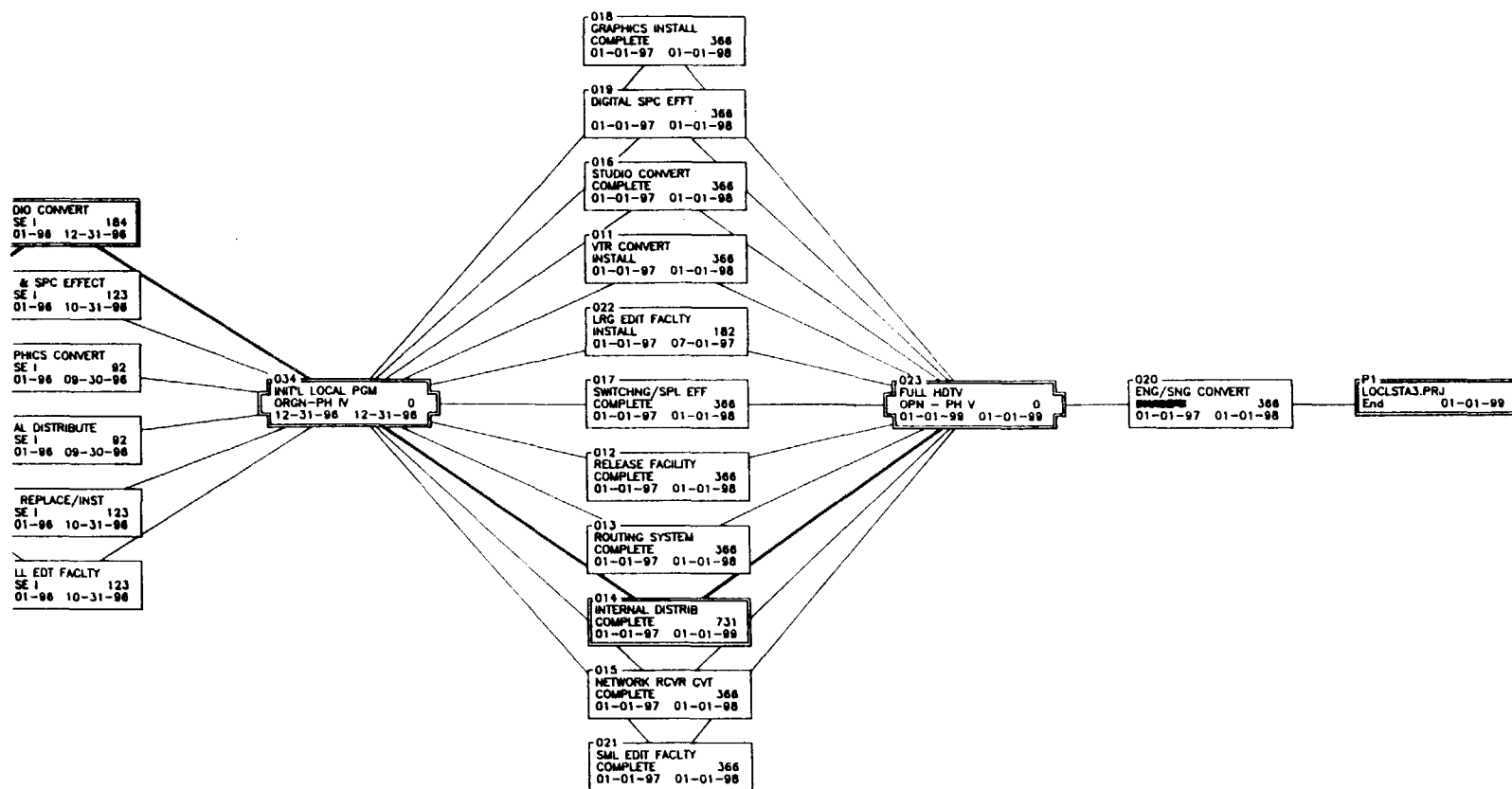


FS SS FF Link Task Selected Task  
FS SS FF Critical Link Crit Task Sel Crit Task

ATTACHMENT D







TAC

# ATTACHMENT E

## RESOURCE QUESTIONNAIRE

Control # \_\_\_\_\_

Good morning/afternoon Mr/Mrs/Ms. \_\_\_\_\_

The FCC has established an advisory committee to help set the HDTV standards for the US. The subcommittee I am working with is trying to figure out how HDTV would be implemented.

We are conducting a survey to learn more about the real world of station operations. We will use the results in our implementation plans. We have called you because we think you are the person at your station with the best information about your station's technical capabilities. We would really appreciate it if you could spare a few minutes to answer some questions. If at any time you feel the questions could be better answered by someone else, please tell me. When our survey is complete we will send you a summary of the results, if you wish.

*Check if desires summary results* \_\_\_\_\_

*If respondent asks how long this will take:*

[12 to 15 minutes]

*If respondent can't talk now, fill out attempt log on cover sheet and make appointment for call back.*

First, we would like some information about your station:

How many studios do you have? (1) \_\_\_\_\_

What is the total number of studio cameras? (2) \_\_\_\_\_

How many post-production editing rooms (or areas) are there? (3) \_\_\_\_\_

Is your on-air playback and switching computer-control? (4) \_\_\_\_\_

Approximately what is the total number of VTRs in the station, excluding ENG? (5) \_\_\_\_\_

What is the primary format used? (6) \_\_\_\_\_

How many separate ENG editing areas (or rooms)? (7) \_\_\_\_\_

How many VTRs are there in the ENG areas? (8) \_\_\_\_\_

How many portable VTRs are there for ENG? (9) \_\_\_\_\_

What is the ENG format? (10) \_\_\_\_\_

How many ENG trucks do you have? (11) \_\_\_\_\_

How many external feeds into the station? (12) \_\_\_\_\_

How many of these are from satellite receivers? (13) \_\_\_\_\_

How many of these are from microwave? (14) \_\_\_\_\_

How many of these are from land line? (15) \_\_\_\_\_

Thank you. Next we would appreciate some general information about the station staff.

How many people does it take at any one time to maintain your on-air operation? (16) \_\_\_\_\_

How many man-weeks are spent each week doing system design,  
equipment maintenance; or new equipment installation? (17) \_\_\_\_\_

Notes: \_\_\_\_\_

Of the station's technical staff, including you, how many are capable  
of designing a complete new production facility? (18) \_\_\_\_\_

How many are capable of designing a new transmitter facility? (19) \_\_\_\_\_

Taking these two groups together, what is the total number of people? (20) \_\_\_\_\_

Do you have anyone dedicated to designing new equipment installations? (21) \_\_\_\_\_

*If yes:* How many? (22) \_\_\_\_\_

*If no:* What part of someone's time is spent on this task (man-days/year)? (23) \_\_\_\_\_

Please classify your station as

Commercial (24) \_\_\_\_\_ or Non-Commercial (25) \_\_\_\_\_

Are you part of a group ? (26) Yes \_\_\_\_\_ No \_\_\_\_\_

*If yes:* What is the group's name? (27) \_\_\_\_\_

*If no:* What is the owner's name? (28) \_\_\_\_\_

*Choose the appropriate word from [ ] below.*

Do you have regular technical design help from your [group]/[owner] or  
some co-owned station? (29) Yes \_\_\_\_\_ No \_\_\_\_\_

*If yes:* How many man-days per year? (30) \_\_\_\_\_

Do you have regular technical design help from equipment vendors?(31) Yes \_\_\_\_\_ No \_\_\_\_\_

*If yes:* How many man-days per year? (32) \_\_\_\_\_

Do you utilize service contracts for equipment maintainance? (33) Yes \_\_\_\_\_ No \_\_\_\_\_

Approximately how much outside consultant time do you use for  
design of new installations? (man-days per year)? (34) \_\_\_\_\_

You have been very helpful. We only have a few more questions; for these, I would like you to assume that you have been told by your management that you need to undertake a large technical project such as building a new NTSC station on a crash basis. There is no budget established and you have been told that cost is secondary. Also assume that all regulatory requirements and permits will be handled by someone else.

We would like you to think about the amount of design manpower for such a project that would be provided by your current staff or by group personnel. You should assume that all other new equipment/projects would be canceled in order to work on this project. In other words, the station would have to be kept on the air; but any non-critical tasks would be deferred until this one was complete. The total project duration will be many months long; so sustainable levels, as contrasted with two week push levels are what we are after. Both the studio and the transmitter would be worked on in parallel.

*If concern expressed by respondent about estimates:*

[We know that the quality of the estimates would be better if you had more specifics and time to consider this; but we really need your best estimates at this time.]

For the studio first:

What fraction of the previously mentioned \_\_\_\_\_ <take number from question (18)> people with the skills to design the production facility could be made available for this? (35) \_\_\_\_\_

How many man-days per week do you think could be provided by your owner/group or sister station employees? (36) \_\_\_\_\_

Now for the transmitter:

What fraction of the \_\_\_\_\_ <take number from question (19)> people you mentioned earlier could be made available for the transmitter design? (37) \_\_\_\_\_

How many man-days per week could be provided by owner/group or sister station employees? (38) \_\_\_\_\_

Can you give us the name of any outside consultant or consultants you would use for design help? (39) \_\_\_\_\_

---

Thank you very much for your time and cooperation.

Rev. 3.4: 12/19/90

TAL

## ATTACHMENT F

Dear Mr/Mrs/Ms. \_\_\_\_\_

As you are aware, the FCC has established an Advisory Committee to help set the HDTV standards for the U.S. The subcommittee studying the implementation of the various alternative systems needs information from a sample of TV station group owners.

Two aspects of the implementation with which we would like your help both relate to how fast the changeover to HDTV will occur. We believe conversion to HDTV will depend on market requirements, and, more importantly, on the availability of technical and financial resources. Groups are expected to stagger conversion of their stations both in the start of conversion and in the degree of HDTV capability as a function of time. We need your help in determining the approximate rate of expenditure, and therefore conversion, that is likely to occur. This will enable us to determine if the rate of conversion is likely to be limited by personnel or financial resources.

For a point of reference, current estimates are that it will cost between \$ 10,000,000 and \$ 20,000,000 to fully convert to HDTV program origination at the station, the price tag being a function of the size of the station operation. Conversion of a typical station to initial operation for passing through network originated programming is estimated to require about \$ 2,000,000 to \$ 5,000,000. Each station will have to continue to simulcast in NTSC for the foreseeable future.

We are in the process of conducting a survey of local station engineers to learn more about technical resources available at the station level. We recognize that group plans and capabilities are perhaps even more important in assembling models for implementation. We would appreciate it if you could spare a few minutes to answer the attached questionnaire, or forward it to someone with instructions to do so.

For your protection we have coded the forms. We will destroy the document that links your group with the questionnaire once we have finished the survey. We hope this will remove any obstacles to your providing detailed information.

We are attempting to gather information from only a small sample of groups, so your cooperation is important. If you feel that you cannot provide all the requested information, please return the questionnaire with as many blanks filled in as possible.

When our survey is complete, we will send a summary of the results to the respondents.

Very truly yours,

S. Merrill Weiss, Vice Chairman  
Implementation Subcommittee Working  
Party 2 on Implementation Scenarios

Attachment

Reply to:

Art Allison  
c/o EMC<sup>2</sup>  
700 Brighton Knolls Dr.  
Brinklow, MD 20862



In the following questions, if you do not have any of the capabilities listed, please answer with a zero.

How many members do you have on your group level technical staff? (1) \_\_\_\_\_

How many of the group's technical staff are capable of designing a new production facility? (2) \_\_\_\_\_

How many are capable of designing a new transmitter facility? (3) \_\_\_\_\_

How many person-days per year are spent on designing new equipment installations by these group personnel? (4) \_\_\_\_\_

Approximately how much outside consultant time do you currently use for design of new installations? (Person-days per year) (5) \_\_\_\_\_

Please characterize your group as

Commercial (6) \_\_\_\_\_ Non-Commercial (7) \_\_\_\_\_

One way to address the conversion project would be to shift skilled personnel among stations in order to get one station on the air at a time. Do you have the capability and the willingness to make this reallocation of personnel? If the answer is no, please put zeros in the appropriate blanks.

For studio type tasks first:

How many person-days per week from group personnel with the skills to design the production facility could be made available for HDTV conversion? (8) \_\_\_\_\_

How many person-days per week do you think could be provided from sister stations? (9) \_\_\_\_\_

Now for the transmitter:

How many person-days per week could be provided from group personnel? (10) \_\_\_\_\_

How many person-days per week could be provided from sister stations? (11) \_\_\_\_\_

Can you give us the name of any external consultant or consultants you would use for design help?

(12) \_\_\_\_\_

\_\_\_\_\_

Could you please circle the current approximate capital budget that most closely fits the five largest stations in your group? Please include capitalizable labor. If you do not wish to put call letters, please use the following codes to identify your market size according to ADI rank:

A = 0-10: B = 11-25: C = 26-50: D = 51-100: E = 101-150: F = 151+.

Station	I	II	III	IV	V
Call Letters/Size	_____ / _____	_____ / _____	_____ / _____	_____ / _____	_____ / _____
Capital budget in \$ Millions	>2	>2	>2	>2	>2
	2	2	2	2	2
	1.5	1.5	1.5	1.5	1.5
	1	1	1	1	1
	.5	.5	.5	.5	.5
	.25	.25	.25	.25	.25
	<.25	<.25	<.25	<.25	<.25

What percent of each station's capital budget could be allocated to HDTV conversion?

Station	I	II	III	IV	V
Percent	95	95	95	95	95
	80	80	80	80	80
	60	60	60	60	60
	40	40	40	40	40
	20	20	20	20	20
	5	5	5	5	5
	0	0	0	0	0

In order to reach HDTV operations in a reasonable time, it is likely that it will be necessary to spend more than is currently being spent for NTSC. Assuming a normal economy, how much more funding, over and above the capital expenditures needed to maintain the NTSC plants, stated as a percentage of the current budget, could be allocated for HDTV conversion each year for the above stations?

Year	1	2	3	4	5	6
Station						
I	_____	_____	_____	_____	_____	_____
II	_____	_____	_____	_____	_____	_____
III	_____	_____	_____	_____	_____	_____
IV	_____	_____	_____	_____	_____	_____
V	_____	_____	_____	_____	_____	_____

What total expenditure did you assume you would make for each station?

I \_\_\_\_\_ II \_\_\_\_\_ III \_\_\_\_\_  
 IV \_\_\_\_\_ V \_\_\_\_\_

Thank you very much for your time and cooperation.

REV. 4.1: December 19, 1990^Z

TAL



**Advisory Committee on  
Advanced Television (ATV) Service**

**ATTACHMENT G**

November 26, 1990

Mr. Donald E. Lincoln  
Director of Engineering  
Sutro Tower, Inc.  
250 Palo Alto Avenue  
San Francisco, CA 94114-2198

Dear Don:

Thank you for agreeing to be the facilitator for the San Francisco Local Area Group of the FCC Advisory Committee on Advanced Television Service (ACATS), Implementation Subcommittee, Working Party 2 on Transition Scenarios. As I explained to you on the phone, the Local Area Group is intended to include all of the television station chief engineers in the Bay area for the purpose of discussing the implementation of High Definition Television (HDTV) in your vicinity.

The HDTV systems currently under study by the FCC and the ACATS are known as "Simulcast" systems. They require the construction of a second transmission facility on a second, stand-alone channel by any broadcaster who intends to implement HDTV. They also require that the broadcaster's existing NTSC channel be maintained in operation for the foreseeable future.

In light of these requirements, it is likely that broadcasters who wish to participate in HDTV will have to install added antennas and transmission lines in addition to new transmitters. The availability of tower capacity, in terms of space, weight loading, and wind loading for the antennas and transmission lines is critical to the ability to implement HDTV. It is to understand what capacity is currently available, what capacity can be made available, and what difficulties might need to be overcome that this effort has been undertaken. In addition, it is hoped that creative solutions can be identified which will make it practical to implement HDTV in spite of any obstacles. Solutions which are particularly useful or clever will be shared with the Local Area Groups elsewhere to help them in their discussions.

The Working Party suggests you try to include in your discussions a local engineering consultant to serve as an advisor on the technical aspects. The person or organization would be asked to volunteer some time for the purpose. If you can identify an appropriate technical advisor but prefer that the request for participation come from the Working Party, please let me know so that we can make the approach.

For the purposes of your discussions, there are a couple of definitions regarding power levels that you should use. Consideration should be given to HDTV systems which operate at both high power and low power. High power systems should be taken as requiring peak power 3 dB lower than NTSC stations with equivalent coverage and having average power equal to NTSC stations with equivalent coverage. Low power systems should be taken as requiring peak power 6 dB lower and having average power 20 dB lower than NTSC stations with equivalent coverage. Of course, the actual power levels in each case will depend on the band under consideration.

Your discussions should cover each of the possible combinations of channel assignments which is feasible for your area. For example, all unused VHF channels might be assigned to HDTV stations, and consideration should be given to accomodating that number of new VHF transmitters. But there is no reason to consider any larger number of new VHF operations than the number of unused channels. Your output should include a listing of the numbers of VHF and UHF channels you have considered in your discussions.

It is suggested that you hold a first meeting at which all the chief engineers or their appropriate designees attend. Try to have pre-arranged for someone to act as a scribe. It is important (since this is a meeting of competitors) to have someone take notes and make them available. They do not have to be lengthy, but should at least report all the items discussed. Someone, possibly the same person, should also be responsible for producing the eventual report to the Working Party.

A document is attached which has been produced by the Working Party to guide your discussions. You may wish to distribute it to the attendees in advance of your first meeting. We have tried to make it sufficiently comprehensive to direct your group without making it too lengthy. If there are any questions it leaves open, please let me know, and we will supply whatever additional information you need.

Depending upon how your first meeting goes, you may wish to assign a small group to do much of the work of putting together options and gathering details needed by the full group. They could conduct their work through telephone and FAX, reporting back to the full group. The full group would then require only one additional meeting to consider what the small group had put together for them. The intention is to minimize the number of meetings and thus the burden on the station personnel. At the same time, this approach recognizes that small groups can often accomplish more in a shorter time than can large groups.

We request that you try to make the arrangements for your first meeting by the end of the year, with that meeting to be held in early January, 1991. We further request that you complete the work and submit a report by the end of March, 1991. An initial, informal report telling of your progress after the first meeting will be appreciated.

If there is any help that the Working Party can provide you to make this process easier or more productive, please let me know. We will do what we can to be of assistance.

Very truly yours,



S. Merrill Weiss, Vice Chairman  
Implementation Subcommittee Working Party 2  
on Transition Scenarios

Attachment

Reply to:

S. Merrill Weiss  
c/o NBC  
30 Rockefeller Plaza  
Room 1600 W  
New York, NY 10112

## STUDY OF ANTENNA AVAILABILITY FOR SIMULCAST HDTV IN SELECTED MARKETS

The next generation of Advanced Television (ATV) systems offers the potential for significant improvements in picture quality, including improved resolution and improved noise performance. The improvements can range from extensions of NTSC to full High Definition Television (HDTV).

Stimulated by broadcaster concern about timely participation in the new technology and about competitiveness with other media, the FCC established an Advisory Committee on Advanced Television Service (ACATS) to stimulate technical development and to advise the FCC. The Committee's activities include technical planning and analysis, economic analysis, system testing, development of implementation scenarios and, by 1992, recommendation to the FCC of an ATV system to be adopted for terrestrial broadcasting.

In April of this year -- with the background of ATV systems by then proposed, several Advisory Committee Interim Reports, and two FCC Notices of Inquiry -- FCC Chairman Sikes stated the FCC's desire to provide terrestrial broadcasting of full HDTV by simulcasting on a second 6 MHz channel made available to each NTSC broadcaster.

The systems to be tested by the Advisory Committee include several that propose to transmit HDTV signals that are bandwidth-compressed and encoded for simulcast transmission in presently unused 6 MHz UHF or VHF channels. The systems are claimed to achieve this without mutual interference or interference to existing NTSC channels.

The Advisory Committee is also acutely concerned with many other aspects of the proposed systems, including how they can be implemented. Implementation issues are being investigated by the Advisory Committee's Implementation Subcommittee, with all the non-regulatory aspects of the transition to ATV examined by Working Party 2 on Transition Scenarios (IS/WP-2). As part of this effort, IS/WP-2 is developing PERT networks and timelines to project how the transition is likely to progress. The Working Party also has conducted a number of surveys to understand how some of the factors it has identified can affect ATV implementation.



Simulcast solutions utilize a second channel and require additional transmission facilities for that channel. Implementation Subcommittee Working Party 2 is trying to determine how the antennas needed for HDTV simulcast can be provided. Some generalities are already known from a previous survey: individual station capabilities run the gamut from vacant space on an owned tower to no present capability for an additional antenna. It is also understood that some markets may face substantial site or regulatory obstacles to the addition of transmission facilities.

In order to get more specific information on implementation feasibility, IS/WP-2 is asking the broadcasters in a few selected markets to consider how they would meet the challenge of providing antennas and other transmission facilities for simulcast HDTV. In some of these markets, antennas and/or sites are already subjects of mutual interest among broadcasters through site sharing, leased or purchased tower space, etc. Such joint approaches are likely to be even more necessary to accomodate ATV in markets where there are insufficient sites and tower spaces currently available.

Your market has been chosen for study of the problems and impediments which must be overcome in order to implement Advanced Television. The objective is to identify obstacles and ways to overcome them. It is important to enumerate all possible mechanisms which might be used to resolve the issues. Some means could be available on a local level, while some might require national solutions. Examples are combining efforts of all local broadcasters in support of one another's applications to local authorities or federal preemption of local radiation limits in excess of federal standards.

You are asked to bring a "community" view to this inquiry! Think freely and do not assume that any solution is impossible. It is important for the Advisory Committee to understand your problems as well as your proposed solutions. This will allow potential fixes for the issues you will face in implementing ATV to be identified in the recommendations the Advisory Committee provides to the FCC.